Secretary of Energy Advisory Board
Nuclear Weapons Complex Infrastructure Review Task Force
Terms of Reference

Background:
During testimony to the House Appropriations Subcommittee on Energy and Water Development on March 11, 2004, the Secretary of Energy agreed to conduct a comprehensive review of the nuclear weapons complex (known as the "Complex" for purposes of this document) in concert with changes in the stockpile, the security situation, and the nature of the world around us as well as limitations in resources. The House Appropriations Report for FY 2005 has also established a requirement for a systematic review of the Complex. The Secretary's study will include the issues identified in the House Report.

The review requested by the House must assess the implications of Presidential decisions on the size and composition of the stockpile, the cost and operational impacts of the new Design Basis Threat (DBT), and the personnel, facilities, and budgetary resources required to support a smaller stockpile. The review will evaluate opportunities for the consolidation of special nuclear materials, facilities, and operations across the complex to minimize security requirements and the environmental impact of continuing operations.

The following is the language in the House Energy and Water Development Appropriations Bill, 2005, page 111 concerning the Complex review:

> *"During the fiscal year 2005 budget hearings, the Committee pressed the Secretary on the need for a systematic review of requirements for the weapons complex over the next twenty-five years, and the Secretary committed to conducting such a review. The Secretary's report should assess the implications of the President's decisions on the size and composition of the stockpile, the cost and operational impacts of the new Design Basis Threat, and the personnel, facilities, and budgetary resources required to support the smaller stockpile. The report should evaluate opportunities for the consolidation of special nuclear materials, facilities, and operations across the complex to minimize security requirements and the environmental impact of continuing operations. The Secretary should assemble a team of outside experts to assist with this review. Prior reviews have largely been conducted by insiders from the weapons complex, who produce the predictable but not very credible recommendation that the Department should preserve the status quo and maintain all existing facilities and capabilities. As part of the five-year integrated budget plan for the entire Department that is directed elsewhere in this report, the Secretary will have to balance NNSA requirements against competing needs for other DOE programs. This will require an objective review that is only possible with the help of independent experts who are not, and have not been, part of the NNSA weapons complex.*
>
> *The Committee directs the Secretary to submit a written report on his findings and recommendations on the NNSA complex to the House and Senate Committees on Appropriations and Armed Services not later than April 30, 2005."*

The delay in passing an Appropriations Bill may result in a modified submission requirement, but until that happens DOE will continue to work toward the April 30, 2005, date.

The NNSA maintains a Complex capable of R&D; engineering; design and manufacture/dismantlement of nuclear weapons; transportation; surveillance and maintenance of nuclear weapons in the Nuclear Weapons Stockpile, and will gather data, options and recommendations to support the Secretary. The effort will focus on developing an efficient integrated enterprise for the certification, manufacture/dismantlement, surveillance, maintenance and testing of stockpile weapons. The present eight Complex sites will be studied to find ways to reduce and consolidate infrastructure (primarily facilities within sites) or to modernize infrastructure where absolutely required to maintain mission capabilities as defined within the Nuclear Posture Review 2001 (NPR-2001), Nuclear Weapons Stockpile Plan (NWSP), the Defense Programs Strategic Vision, the security Design Basis Threat (DBT), and other pertinent guidance. Particular attention will be paid to reducing duplicated capabilities among NNSA sites and examining DoD sites where duplication with NNSA sites may exist, but only to identify potential duplication of NNSA capabilities. DoD capabilities that provide support to the NNSA will also be identified.

The NNSA study will provide dual benefit: (1) information for the Secretary's review and (2) recommendations for NNSA's tactical and strategic planning efforts.

Assumptions:

- Maintain a safe, secure and reliable nuclear weapons stockpile.
- Maintain a science and technology capability to support the nuclear deterrent.
- Minimize or, where appropriate, eliminate redundant capabilities while maintaining an integrated nuclear security enterprise consisting of R&D, engineering, test, transportation and production/dismantlement facilities and infrastructure that operates in a responsive, efficient, secure and safe manner.
- The Complex must support a total stockpile of 2000 – 6000 warheads during the transition to the post-2030 stockpile.
- The Complex must have the capability to produce a limited number of pits and secondaries to support future stockpile requirements.
- As the Complex plans for transforming the nuclear deterrent, reducing the cost will be a major operating principle.
    - New and modified warheads will include new technologies and designs that allow for more efficient manufacturability, increased performance margins, increased safety and use-control, and improved longevity.
    - The use of special or difficult to handle materials or processes will be minimized.
- The Complex will have the capability to produce all required nuclear components.
- The number of processes unique to the manufacture and support of nuclear weapons will be reduced.

Scope & Objectives:
The goal of the study is to gather data, define options and develop recommendations that, if implemented, will create a smaller, modern Complex infrastructure that is responsive to post-cold war mission requirements. By starting with a near clean sheet of paper, every site will likely be affected, some more than others.

Time Frame to be used for the study:
The study will consider mission requirements, and the supporting Complex, from 2005 through 2030. Near-term will be the next five years. Mid-term will be 2010 - 2020 and the long-term will be 2020 - 2030. Options and recommendations for the mid- and long-term changes in the Complex may require actions to start in the near-term.

Terms of the study:
The study will evaluate the infrastructure required to meet post-cold war program mission deliverables. The major deliverables include weapon refurbishment activities, possible new weapons developments, maintenance actions, surveillance activities and dismantlements while developing and fielding the required core technical capabilities and capacities for the future. For at least the short-term (2005-2010), all existing sites will be maintained, but will be evaluated for consolidation to smaller footprints and reduced levels of activities. For the longer-term, radical changes in site missions may be recommended. The effectiveness and efficiency across the Complex while maintaining program mission capability as well as security and safety standards will be paramount. Initially, the focus of the study will be to identify duplicative capabilities within the Complex and examine whether or not this duplication is technically and scientifically justified and cost effective, but the study must go further. The study must address the question of how do we design, test, manufacture, maintain and ultimately dismantle weapons in the 21st century. This is the responsibility of the Complex.
Areas of initial focus based on known duplication within the Complex:

- High Explosive (HE) R&D and production.
- Pu and Highly Enriched Uranium (HEU) R&D and production
- Hydrodynamic testing
- Design and certification
- Tritium R&D and production
- Be and BeO production
- Non-nuclear component testing and production
- Non-nuclear and nuclear material R&D, testing and production
- Others TBD

The ability to engage the weapons design community to assess and implement design enabling changes such as Insensitive High Explosives (IHE) throughout the stockpile and elimination of special materials will be an important aspect of improving safety, security and cost effectiveness. The security aspects alone warrant many of these changes. The study will engage the Complex to change processes that drive costly infrastructure or

facilities and will make recommendations for changes through design, manufacture or maintenance modifications.

Deliverables:
A report will be developed outlining a set of options and recommendations based on the data gathered and analyses of information. The options and recommendations will be developed in conjunction with discussions with all sites in the Complex and NNSA HQ management. The comments from individual sites will be included in the report. An interim report will be issued by April 30, 2005.

Estimated Number and frequency of Meetings:
This Infrastructure study group shall meet as required. In order to enhance members' knowledge and understanding of the infrastructure issues, sites visits will be required. Additionally, the subcommittee may meet outside of Washington, D.C. as required to fulfill its mandate.

Membership:
The Nuclear Weapons Complex Infrastructure Review Task Force shall have approximately five members. The members shall be drawn from fields important to the Nuclear Weapons Program, facility and construction management and shall represent a balance of viewpoints pertinent to the scope and objectives of the review. The Chairman of SEAB, in consultation with the Secretary of Energy, shall appoint the Chair and the members of the task force.

Duration and Termination Date:
This subcommittee will serve for approximately six months, with most of the work occurring from January through April 2005.

Approved: January 26, 2005